Subject index

A

A-afferents 508
Acetylcholine 84, 338, 460, 543, 668
– induced Ca^{2+} mobilization 460
– receptor channel 380
– receptors 579
ACh-evoked responses 668
Acidosis 310
Acinar cells 338
Aconitine 514
ACTH response 629
Actinomycin D 657
Action potential 478, 534
Activation 596
Active transport 425
A-current 386
Adaptation 319
Adenosine 288
Adenylate cyclase 144
ADH 327
ADM 177
Adrenal medulla 444
Adrenaline 371
– inhibition 131
Adrenoceptors 131
Adrenocorticotrophic hormone 629
Adrenocorticotropic hormone 425
A6 epithelia 632
Aerobic metabolism 177
Afterhyperpolarization 478
Afterload 7
Age-related defect 327
Aging 38
– mice 327
Alkaline stress 418
Alkaloids 514
Allotetrahydrodeoxycorticosterone 263
Amiloride 32, 101, 401, 632
Amines, primary, secondary, tertiary 84
Amino acid secretion 499
2mM 4-aminopyridine (4-AP) 486
4-Aminopyridine 25, 93, 467, 534
AMP 177
– synthesis 144
Anoxia 108
Anthracene-9-carboxylic acid (9-AC) 553
Antidiuretic hormone 212
Antidromic vasodilation 508
Antigen sampling 425
Antipyrylazo III 166
Aorta 57, 230, 401
Aortic baroreceptors 21
– clamping 1
– impedance 7
Arachidonate metabolism 616
Arginine formation 492
– vasopressin (AVP) 394
Arteries 51
Arterioles 508
Arylaminobenzoate-type chloride channel blockers 190
Assisted-Mode perfusion 7
Astrocytes 263
ATP 13, 177
–, intracellular 332
– regulated K channels 108
–-sensitive K^+ channel 25
Atrial distension 610
– mechanoreceptors 610
– myocytes 296
Atropine 13
Autoregulation 622
Autoregulatory index 622
Axotomy 665

B

B cell membrane 131
Ba^{2+} 57, 144
Ba^{2+} entry 274
Ba current 596
Baclofen 444
Barium 76, 559
Basal metabolic rate 38
Basolateral amino acid transport 492
– membrane vesicles (BLMVs) 249
– uptake 492
Bay K8644 184, 281, 651
Benzodiazepine agonists 263
Bernoulli pressure drop 7
Bicarbonate 76
Big Ca^{2+}-dependent K^+ channel 57
Bladder epithelial cells 504
Block of Ca^{2+} entry 197
Blood brain barrier 616
– flow changes 450
– gas 38
Body fluid regulation 610
Bone cell 358
Brain slice spectrophotometry 205
Bromate 152
Brush border membrane vesicles (BBMVs) 249
BTX 514

C

C2 myotubes 380
Ca^{2+} activity 69
Ca^{2+} buffering 296
Ca^{2+} channel 444
Ca^{2+} channel activity 651
Ca^{2+} channel blockers 184
Ca^{2+} channel modulators 184
Ca^{2+} channels 478
Ca^{2+} chelating compounds 296
Ca^{2+} chelator 371
Ca^{2+} concentration 657
Ca^{2+} current 386, 651
Ca^{2+} current blocked by Cd^{2+} 197
Ca^{2+} entry 274
Ca^{2+} inflow 197, 478
Ca^{2+} ions 662
Ca^{2+} mobilization 460
Ca^{2+} pathway 144
Ca^{2+} release 296, 371
Ca^{2+} removal 332
Ca^{2+} sensitive dye, antipyrylazo III 166
Ca^{2+} signal generation 668
Ca^{2+} transport 212
Ca^{2+}-activated Cl^- current 553
Ca^{2+} antagonist (TBM-8) 144
Ca^{2+}-dependent Cl^- current 668
Ca^{2+}-dependent K^+ channels 486
Ca^{2+}-dependent K^+ conductance 371
Ca^{2+}-sensitive K^+ channels 69
Ca, intracellular 332
Ca agonist 281
Ca antagonist 281
Ca channels 267, 433, 596
Ca current 267
Ca store site 267
CaCl transport 327
Ca-dependent K current 267
Cadmium 583
– chloride 534
Caffeine 166, 267, 478
Calcitonin 425, 472, 644
Calcitonin gene-related peptide 644
Calcium 559, 632
– channels 274
– current 138, 478
– mobilisation process 51
– oscillations 639
– release 166
– transport 184
– – system 184
– -induced calcium release 478
– -sensitive potassium current 478
Calmodulin antagonists R 24571 138
– – R 24571 and W-13 138
cAMP 144,433
cAMP-dependent phosphorylation 433
– protein kinase 415
Capillary density 225
Carbachol 38, 332,537, 639
Carbon dioxide 38
– – tension 51
Cardiac action potential 534
– arrest 1
– Ca channels 433, 596
– denervation 610
– muscle 310
– myocyte(s) 160, 296, 433, 644
– pacemaker (i_f) channels 662
– pacing 529
Catalytic subunit 415
Catecholamines 243
Cation channel 632
Cd^{2+} 197
cDNA 543
Cell attached membrane 209
– culture, primary 57,69
– height 349
– membrane potential 209
– – resistances 76
– transformation 418
– volume 349
– – regulation 572
Cellular Cl 540
– K 540
Channel inactivation 486
Charybdotoxin 57
Chloramine-T 93, 514
Chlorate 152

Chloride channel blockers 190
– conductance 152, 358, 522, 534
– current 332
– secretion 190
Choline 84
Chromaffin cell(s) 13, 444
Ciliary body epithelium 454
Citrulline 492,499
L-citrulline 492
CK-isoenzyme 304
Cl^- channel 209,358
Cl^- channel blocker 144
Cl^- channels 263
Cl^- channels inhibitors 553
Cl^- conductance 43, 209
Cl^- secretion 144, 572
Cl^-/K^+ conductance ratio 43
Co^{2+}-sensitive activation 288
Colchicine 657
Colon 190
– carcinoma 209
Colonic crypts 144
Compound 48/80 409
Computer assisted image processing 529
Concanavalin A (Con A) 138
Conscious dog 610
Contractile proteins 166
Contractility 51
Contraction 1
Corneal endothelium 454
Coronary artery 460,622
– perfusion 7
Cortical thick ascending limb 212
Cotransport mechanism 583
[^{14}C]polyethyleneglycol-4000 425
Creatine 177
– kinase (CK) 304
Cromakalim 69
Culture medium 665
Cultured renal (A6)epithelium 349
– – epithelial layers 572
Cyclic AMP 668
Cycloheximide 657
Cysteine 583
Cytochrome redox changes 205
Cytoplasmic alkalinization 138
– Ca^{2+} 639
Cytosolic Ca^{2+} concentration 338, 657

D

DA_1 receptors 243
Deafferentation 665
Dehydroisoandrosterone 3-sulphate 263
Delayed rectified outward current 386
– rectifier 486
Depolarization-controlled release 197
Desensitization 13, 543, 579
Development 281
DHPDS 215
Dialysis 1
Diarrhoea 190
Dibutyryl cyclic AMP (dbcAMP) 668
– -cAMP 327
DIDS 358, 553, 572
Diethylpyrocarbonate 138
Dihydropyridines 281
5,7-Dihydroxytryptamine 21
Diltiazem 57, 184
Dimethylsulphoxide (DMSO) 249
Dinitrophenol 425
Diphenylamine-2,2-dicarboxylic acid (DPC) 553
Dissociated muscle fibres 380
Distribution ratio 84
Divalent cations 288, 559
Domperidone 243
Dopamine-1 receptors 243
Dorsal root ganglion 138
Driving forces 84
Ducts 76
DUM neurons 665

E

EGTA 296
Ejecting heart 7
Elcatonin 425
Electrical activities 205
Electrodes carbon-fibre 409
Electrolytes, weak 138
Electron microprobe 472
– – analysis 212
Electrophysiological studies 218
Electrophysiology 380
Embryonic mammalian sensory neurons 281
Endocytosis 425
Endogenous antipyresis 394
– pyrogen 616
End-plate potentials (EPPs) 274
Endurance training 225
Energy cost 177
Enflurane-anaesthetizid swine 622
Enteric nervous system 566
Enterocytes 144
Enzymes, isoforms 230
Epicardial fibre strain 529
Epithelia 256, 349, 632
Epithelial cells 504
– Na^+ channel 101
– sodium conductance 101
– -like Na^+ channel 401
Equilibrium potential 534
Ethylenebis(oxonitrilo)tetraacetate (EGTA) 166, 267
Ethylisopropylamiloride 32
Evoked vasodilation 508
Evolution 665
Excitation-contraction coupling 651
Exercise 1,115, 304
Exocytosis 409
Extracellular 1
– guanosine 160
– matrix 218
Extrajunctional nAChR 380

F

Fatty acid 467
– oxidation 115
Febrile response 629
Fenoldopam 243
Fever 394,616, 629
Fiber-optic measurement 215
Fibre cross-sectional area 225
– type transitions 127
Filtration fraction 235
Fish muscle 177
Flickery block 25
Fluorescent dye, fura-2 184
– microbeads 349
Force production 310
Forskolin 69, 144
Frog skin 632
Fura-2 444
– fluorescence 371
Fused Madin-Darby canine kidney cells 43

G

GABA 444
$GABA_A$ receptors 263
$GABA_B$ receptors 444
Gamma aminobutyric acid (GABA) 444
Gastric corpus 566
Gastrocnemius muscle 1
Gating of rat brain Na^+ channels 559
– – – – – sodium channels 514
– trypsin 514
Glibenclamide 69
Glomerular filtration rate (GFR) 111
– ultrafiltration 235
Glomeruli 235, 243
Glucacon 472
Glucose 639
– metabolism 115
– transporters 249
– -dependent oscillations 639
Glutamine 111
Glycolysis 177
Goldman equation fit 101
G-protein 444
Growth and aging 38
GTP S 444
GTP-binding protein G_s 433
Guanosine metabolism 160

H

Halothane 38
Heart cells 108
– muscle 115
– rate 610
Henle's loop 212,327
Hepatorenal reflex 111
Hexamethonium 13
$HgCl_2$ 249
High altitude 121, 225
Hippocampal CA3 neurons 288
Histidine 583
– -specific reagents 138
HT_{29} cell 209
Human term placental cells 421
Hydrophobicity plot 84
6-Hydroxydopamine (6-OHDA) 394
5-Hydroxy-tryptamine (5-HT) 409
Hyperosmolarity 43
Hyperpolarization 144, 537
Hyperpolarizing inward rectification 288
Hypertonicity 43
Hypertrophy 230
– right ventricular 121
Hypothalamic paraventricular nucleus 394
Hypoxia 225
Hypoxic pulmonary hypertension 121

I

Ileal epithelial cells 184
Ileum 267

Inactivation 478, 514, 596
– of channels 93
Indolizinsulphone SR33557 651
Indolizinsulphones 651
Indomethacin 616
Inositol 1,4,5-triphosphate 639
Insulin release 131, 639
Interface chamber method 205
Interleukin-1 beta 616
Interleukin-1β (IL-1β) 629
Interleukin-2 380
Intermittent high-altitude (IHA) exposure 121
Interventricular septum 622
Intestinal crypts 537
– epithelia 249
– smooth muscle cells 267
Intestine 249
Intracellular acidification 51
– ATP 332
– Ca 332
– Ca^{2+} 338, 444
– Ca^{2+} chelating compounds 296
– Ca^{2+} stores 553
– calcium 662
– divalent cations 559
– Na^+ concentration 101
– Pb^{2+} 274
– pH 138, 215, 418
– – regulation 338
Inverted microscope 349
Inward currents 296
– rectifier(s) 421, 657
Inwardly rectifying K^+ channel 358
Ion channels 559
Ionic channels 603
– fluxes 131
Ionomycin 338,657
Ischaemia 1
^{125}I-Sch 23982 binding 243
3-Isobutyl-1-methylxanthine (IBMX) 433
Isoenzymes 304
Isolated adult DUM neurons 665
– colonic crypts 144
– heart cells 108
– perfused liver 215
– proximal cells 583
– rat ileal epithelial cells 184
– – osteoclasts 358
– tubules 243
Isometric force/time integral 1
Isoproterenol 596

J

Jumping training 127
Juxtaglomerular cells 32

K

K channels 108
α_1-Adrenoceptor 371
α-(Phentolamine) 243
β Subunits 579
β-Adrenergic agents 596
β-Adrenergic modulation 433
β-Adrenergic stimulation 433
β-(Propranolol) 243
γ-Aminobutyrate 263
γ-Aminobutyrate-induced currents 263
K-channel 93
KCL accumulation 43
K-Cl cotransport 540
Ketanserin 243
Kidney 84, 472,583
– aging 327
– cells 256, 418
– cortex 249, 450
– medulla 450
K^+ channel(s) 69, 358
– – properties 467
K^+ concentration 76
K^+ conductance 43, 76, 144, 288, 371, 537
K^+ currents 386, 657

L

Lactate 1
– dehydrogenase activity 230
Lactography 1
Lanthanum (La^{3+}) 274
LDH, isoforms 230
Lead, actions of 274
Lectins 138
Left atrial pressure 610
Lens epithelium 454
Lidocaine 57
Ligand-activated K^+ conductance 288
Lipid bilayers 559
– membranes 514
Lithium 588
Lorentzian noise levels 632
Low K sheep red bleed cells 540
L-type Ca channels 433
– Ca^{2+} channel activity 651
– cardiac Ca channels 596

M

Madin-Darby canine kidney cells 418
Mammalian muscle cells 380
Mandibular acinar cells 338
Mast cells 409
MDCK 572
MDCK cells 43, 418
Medullary thick ascending limb 327
Membrane conductance 514
– currents 332,386, 644
– excitability 559
– potential(s) 69, 131, 184, 386, 418, 504, 537
– potential oscillations 418
– resistance 76, 504
– vesicles 249
Mesenteric infusion 111
– resistance 51
Metabolic rate 38
Methylene Blue 138
Methysergide 111
Mg^{2+} transport 212
Mianserin 243
Microdialysis lactography 1
Microdissected rat nephron 243
Microelectrode studies 504
Microfluorimetric imaging 338
Microperfusion 212
Micropuncture 235,472
Microscopy 349
Microspheres 622
Microtubular system 657
Mitochondria 115
Modulated-receptor model 603
Mono- and bisquarternary compounds 84
Monoiodoacetate 425
Monolayers 256
Motor nerve terminals 274
mRNA injection 101
Muscarine 13
Muscarinic agonist 338
– receptor 332
Muscle 127, 152, 319, 522, 651
– capillarity 225
– cells 380
– damage 304
– fibers 166, 177
– histology 304
– metabolism 1
– pyruvate dehydrogenase complex 115
– stiffness 127
Myelinated nerve fibre 588, 603
Myenteric neurones 566
Myocardial contraction 529
Myocyte(s) 296, 415, 433, 534
Myofibrils 310
Myofilament space Ca^{2+} 166
Myometrial cells 386
Myosin antibody 319

N

N^1-methylnicotinamide 84
Na channel(s) 454, 603
NaCl reabsorption 212
NaCl transport 212
Na/H exchange 32
Na^+ binding site 101
Na^+ channel(s) 415, 514, 632
Na^+ channel block 588
Na^+ current 386, 665
Na^+ currents 514
Na^+ entry pathway 401
Na^+ replacement 537
Na^+ self-inhibition 101
Na^+ transport 349
Na^+Ca^{2+} exchange 296
Na^+/H^+ antiport(er) 43, 338
Na^+/H^+ exchange 338
Na^+/K^+-ATPase 43
Na/K-ATPase 243
Na/P_i cotransport 256
Narcolepsy 21
Nasal mucosa 425
Neomycine 138
Neosynthesis of sodium channel proteins 665
Nephron segments 243
Nerve fiber types 508
– fibre 603
Nerve terminal(s) 197, 274
Neuroblastoma cells 93, 467
Neurokinin A 566
Neurokinin B 566
Neuromodulation 288,380
Neuromuscular junctions 274
– transmission 197
Neuronal nicotinic acetylcholine receptor(s) 543, 579
Neurones 138
Neurons 288
– 665
Nicotine 13

Nicotinic acetylcholine receptors 579
– agonists and antagonists 13
– receptor(s) 13, 543
Nifedipine 69, 184, 386
Nimodipine 281
Nitrate 152
NK-3 receptors 566
Node of Ranvier 603
Nodose ganglion 21
Noise analysis 632
– level 205
Non-filtering kidney 499
Noradrenaline 371
– (NA) 394
Noradrenergic input 394
Norepinephrine 51
NPPB 190
5'-Nucleotides 160
Nucleus tractus solitarius 21
Nystatin "perforated-patch" approach 537
Nystatin technique 209

O

Ocular epithelia 454
Oestradiol 304
Oocytes 543, 579
Opossum kidney cells 256
Ornithine formation 492
Oscillatory work 177
Osmolality 349
Osteoclasts 358
Ouabain-resistant [Rb(K)] influx 540
Outwardly rectifying Cl^- channel 358
Overload 319

P

P_aCO_2 homeostasis 38
Pancreas 76
Pancreatic acinar cells 668
– islets 131
Pancreatic β cells 639
Paracellular shunt 76
Paradoxical sleep 21
Paraventricular nucleus 394
Parotid gland 332
Patch-clamp 57, 209, 263, 371, 386, 421, 486, 534, 537, 668
– – seal formation 218
––– technique 267
Pb^{2+}, actions of 274
Pb^{2+}, intracellular 274
Perfused rat heart 121
Peripheral resistance 51
Peritoneal macrophages 371
Pertussis-toxin-sensitive inhibition 444
pH, Extracellular 32
– 51, 310
Phenamil 401
Phorbol esters 338
Phosphate 310
– "adaptation" 256
– limitation 256
– transport 256
Phosphocreatine 177
Phosphoinositide regulatory cascade 472
Phosphoribosylpyrophosphate 160
pH-Sensitive dye 2',7'-bis(2-carboxy-ethyl)-5(and -6)carboxyfluorescein (BCECF) 51
– dyes 215
Placental cells 421
Planar lipid bilayers 559
– – membranes 514
Plasma membrane 43
Plethysmography 508
Polarity 256
Polarographic measurement 450
Polypeptide transport 425
Polypeptides 425
Portal vein 230, 401
Postsynaptic inhibition 288
Potassium channel(s) 25, 93, 467, 486, 537
– conductance 57, 358
Potassium current(s) 281, 332, 421
Prazosin 371
Pressure-flow characteristics 622
Primary culture 553
Propranolol 371
Prostaglandin 616
Protein kinase 415, 433
– – A 144
– – C 57, 338
– – – inhibitors 338
– synthesis inhibitors 665
Proximal convoluted tubule 472
– tubule 84, 256
Pulmonary hypertension 121
– resistance 121
Pyruvate 7
Pyruvate dehydrogenase complex 115

Q

Qinine 57
Quinacrine 409

R

Rat 38
Rb(K) influx 540
Receptor(s) 263, 644
– model 603
Receptor-operated inward current 13
Recombinant human interleukin-1β (rhIL-1β) 616
– rabbit interleukin-1β (rrIL-1β) 616
Rectifier K^+ currents 657
Rectifying currents 421
– K^+ conductance 288
Redox state 205
Regulation of respiration 38
Renal blood flow 450
– carcinoma 418
– cell culture 256
– cortex 450
– epithelia 249
– epithelial cell 572
– glomerular filtration rate (GFR) 111
– juxtaglomerular cells 32
– medulla 43, 450
– sympathetic nerve activity 610
– transport, organic cations 84
– – 472
Renin secretion 32
+synthesis 32
Repolarization 131
Resting zero-current potential 144
Ribose-enhanced GTP synthesis 160
Right coronary artery (RCA) 622
– ventricular function 121
Riluzole 603
Rose Bengal 138
Rp-cAMPs 433
Rubidium 540
Ryanodine 267, 460, 478, 657

S

Salivary gland 332, 338
Sarcolemma 486
Sarcoplasmic reticulum 166, 296
Saxitoxin 588
Second messenger system 380
Secretin 76
Secretion 32
– intestinal 537
Secretory diarrhoea 190
– responses 144
Sensitivity 543
Sensory neurons 281
Sequence of contraction 529
Serotonin 21,243
Serotoninergic hepatorenal reflex 111
Sex difference 304
Short-circuit current 190
Single cardiac myocytes 644
– channel 401
– myometrial cells 386
Single smooth muscle cell(s) 267, 460
Sino-atrial (SA) node cells 662
SITS 358, 534
Skeletal muscle 25, 115, 127, 486, 508, 522, 651
– capillarity 225
– fibers 166
– fibres 657
Skinned cardiac muscle 310
– skeletal muscle fibers 166
Small intestinal crypts 537
Smooth muscle cells 57, 69, 401, 460, 553
– – tissue 230
SNGFR 235
Sodium 588
– channels 454, 514, 665
+current 665
Spectrophotometric signals 205
Spironolactone 553
Staurosporine 338
Steroids 263
Stiffness changes 127
Stimulus-secretion coupling 639
Strontium 559
Substance P 566
Substitute anions 152
Succinate dehydrogenase activity 319
Superficial glomeruli 235
Surface charges 559
Swelling of cells 572
Sympathetic ganglion 478

T

Tachykinin 566
– analogues 566
– receptors 566
TEA 486
Teleost fast muscle fibres 177

Temperature 177
Tetanic stimulation 274
Tetraethylammonium 84, 332
– (TEA) 386
Tetramethylammonium$^+$ 43
Tetrodotoxin 401, 454, 588
– (TTX) 386
Toad bladder 504
– kidney 492, 499
– urinary bladder 632
Training 127
Transcellular leak 499
Transepithelial ion net fluxes 472
– – transport 572
– potential 327
– resistance 76
Transient outward current 534
Trans-inhibition kinetics 540
Transmitter release 274
Trans-patch membrane potential 401
Transport kinetics 84
Treadmill 115
– exercise 304
Tricuspid regurgitation 121
Trypsin 514
T-type Ca^{2+} channels 553
Tubular metabolism 492

U

Ultrafiltration coefficient 235
Urinary bladder 230
– concentrating ability 327
– flow rate 111
Ussing-type chamber 349

V

Valinomycin 184
Vascular smooth muscle 460
– – – cells 69, 401, 553
Vasoactive intestinal polypeptide (VIP) 668
Vasodilatation 508
Vasopressin (ADH) 327
Ventilation 38
Ventilatory control by CO_2 38
Ventricular cells 644
– myocyte(s) 415, 534
– outflow tract 7
– performance 121
– perfusion 622
Verapamil 57, 69, 184
VIP 668
VIP-evoked Ca^{2+} signals 668
Vitamin E deficiency 304
Voltage clamp 152, 522, 579, 588, 603, 651
Voltage-clamp 288, 534, 657, 665
– recording 13
Voltage-dependent gating 559
Voltage-sensor structure 651
Voltammetry 409
Volume regulation 43, 572
VT 514

W

Water channels 249
– transport 472
Weak electrolytes 138
Whole cell patch clamp 534
– – voltage-clamp 644

X

Xenopus laevis 492, 499
– – oocytes 101
– oocytes 543, 579

Y

Yohimbine 371

Z

Zinc uptake 583